

### REMARKS

In response to the Notice of Defective Translation, applicants respectfully submit that pages 48-50 of the specification as originally filed contained an English language translation of the claims. Applicants again submit this English language translation of these claims, and ask that they be entered.

A substitute sequence listing, with translation of relevant portions into English, is submitted with the replacement specification in the present amendment.

In response to the Notice to Comply with Requirements for Patent Applications Containing Nucleotide Sequence and/or Amino Acid Sequence Disclosures, a copy of the substitute sequence listing in computer readable form is attached hereto. The content of the paper copy of the sequence listing and the copy of the sequence listing in computer readable form is the same, and includes no new matter.

The replacement specification has an updated Sequence Listing with current information pertinent to the present application. This information includes the names of the proper applicants, the serial number and filing date of the present application and the application number and filing date of the corresponding international application. The substitute sheets of the Sequence Listing also contain 24 sequences that are found in the body of the specification which were not included in the originally filed Sequence Listing.

The following sequences are found on the following pages in the original specification: SEQ ID NO's 9-11: p. 31; SEQ ID NO's 12/13: p. 36; SEQ ID NO's 14/15: p. 37; SEQ ID NO's 16-19: p. 38; SEQ ID NO's 20/21: p. 42; SEQ ID NO's 22/23: p. 43; SEQ ID NO's 24/25: p. 44; SEQ ID NO's 26-29: p. 45; SEQ ID NO's 30-33: p. 46. The

nature of these sequences, PCR primers, is also described on those pages. The original specification has also been amended to include the sequence identification numbers where these are appropriate to aid in the identification of the nucleic acid sequences to which reference is made.

The previous Sequence Listing, which was numbered as pages 1-22 has been renumbered as pages 1-24, and again included at the end of the replacement specification.

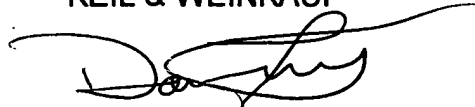
Applicants respectfully assert that the substitute specification as a whole, and the substitute Sequence Listing in particular, contains no new matter.

It is believed that by submitting the present amendment and the sequence listing diskette, the application now fully complies with the requirements of 37 CFR §§ 1.821-1.825. Applicants respectfully solicit issuance of the patent.

Please charge any shortage in fees due in connection with the filing of this paper, including Extension of Time fees to Deposit Account No. 11-0345. Please credit any excess fees to such deposit account.

Respectfully submitted,

KEIL & WEINKAUF

A handwritten signature in black ink, appearing to read 'David C. Liechty', with a long horizontal flourish extending to the right.

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**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**IN THE SPECIFICATION**

Amend the paragraph on page 11, line 38 to page 12, line 2 as follows:

For example, the plant expression cassette can be incorporated into the tobacco transformation vector pBinAR-Hyg. Fig. [1] 2 shows the tobacco transformation vectors pBinAR-Hyg with the 35S promoter (A) and pBinAR-Hyg with the seed-specific promoter phaseolin 796 (B):

- HPT: hygromycin phosphotransferase
- OCS: octopine synthase terminator
- PNOS: nopaline synthase promoter
- also drawn in are those restriction cleavage sites which cut the vector only once.

Amend the paragraph on page 31, lines 5-24, as follows:

Oligonucleotides for a PCR were derived from the DOXS DNA sequence (Acc. Number AF035440), and a BamHI restriction cleavage site was attached to them at the 5' end, and an XbaI or another BamHI restriction cleavage site was attached to them at the 3' end. The oligonucleotide at the 5' end comprises the sequence 5'-atggatccat gagtttt-gat attgccaaat ac [ATGGATCCATGAGTTTT-GATATTGCCAAATAC] -3' (SEQ ID No. 9) (nucleotides 1-24 of the DNA sequence; in italics) starting with the ATG start codon of the

gene, and the oligonucleotide at the 3' end comprises the sequence 5'- attctagatt atgccagcca ggccttg [ATTCTAGATTATGCCAGCCAGGCCTTG] -3' (SEQ ID No. 10) or 5'- atggatcctt atgccagcca ggccttg [ATGGATCCTTATGCCAGCCAGGCCTTG] -3' (SEQ ID No. 11) (nucleotides 1845-1863 of the reverse complementary DNA sequence; in italics) starting with the stop codon of the gene. The PCR reaction with the two BamHI-containing oligonucleotides was carried out with Pfu polymerase (Stratagene GmbH, Heidelberg) in accordance with the manufacturer's information. 500 ng of the genomic DNA from E. coli were employed as template. The PCR program was as follows:

5 cycles: 4 sec 94°C, 30 sec 52°C, 2 min 72°C;  
5 cycles: 4 sec 94°C, 30 sec 48°C, 2 min 72°C;  
25 cycles: 4 sec 94°C, 30 sec 44°C, 2 min 72°C.

Amend the paragraph on page 36, lines 11-20, as follows:

Oligonucleotides were derived for a PCR from the DNA sequence of the HPPD from *Streptomyces avermitilis* (Denoya et al., 1944; Acc. Number U11864), and a BamHI restriction cleavage site was attached to the 5' end of them and an XbaI restriction cleavage site was attached at the 3' end of them. The oligonucleotide at the 5' end comprises the sequence 5'- ggatccagcg gacaagccaa c [GGATCCAGCGGACAAGCCAAC] -3' (SEQ ID No. 12) (37 to 55 bases distant from the ATG in the 5' direction; in italics), and the

oligonucleotide at the 3' end comprises the sequence 5'-  
tctagattat gccagccagg ccttg [TCTAGATTATGCCAGCCAGGCCTTG] -3' (SEQ ID No. 13) (nucleotides 1845-1863 of the reverse complementary DNA sequence; in italics).

Amend the paragraph on page 37, lines 28-44, as follows:

To clone the HPPD in vectors which additionally contain another cDNA, oligonucleotides were derived for a PCR and had a BamHI restriction cleavage site attached at the 5' end and at the 3' end. The oligonucleotide at the 5' end comprises the sequence 5'-  
ggatcctcca gcggacaagc caac [GGATCCTCCAGCGGACAAGCCAAC] -3' (SEQ ID No. 14) (nucleotides 37 to 55 distant from the ATG in the 5' direction; in italics), and the oligonucleotide at the 3' end comprises the sequence 5'- atggatcccg cgccgcctac aggttg [ATGGATCCCGCGCCGCCTACAGGTTG] -3' (SEQ ID No. 15) (terminating at base pair 1140 of the coding sequence, starting 8 base pairs 3' from the TAG stop codon; in italics). The PCR reaction was carried out with Tli polymerase (Promega GmbH, Mannheim) in accordance with the manufacturer's information. 10 ng of the plasmid pBinAR-HPPD were employed as template. The PCR program was as follows:

5 cycles: 94°C 4 sec, 68°C 30 sec, 72°C 2 min;

5 cycles: 94°C 4 sec, 64°C 30 sec, 72°C 2 min;

25 cycles: 94°C 4 sec, 60°C 30 sec, 72°C 2 min.

Amend the paragraph on page 38, lines 11-28, as follows:

For the cloning, the 35S promoter, the transketolase transit peptide, the HPPD gene and the polyadenylation signal of gene 3 of the T DNA of the Ti plasmid pTIACH5 (Gielen et al. 1984) for termination of transcription was isolated from the plasmid pBinAR-TP-HPPD by PCR. A HindIII cleavage site was attached in each case to the oligonucleotides for the promoter and the terminator. The sequence of the oligonucleotide which anneals onto the 5' region of the promoter (in italics) is 5'- ataagcttca tggagtcaaa -gattcaaata ga [ATAAGCTTCATGGAGTCAAA-GATTCAAATAGA] -3' (SEQ ID No. 16), and that of the oligonucleotide which anneals onto the termination sequence (in italics) is 5'- ataagcttgg acaatcagta aattgaacgg ag [ATAAGCTTGGACAATCAGTAAATTGAACGGAG] -3' (SEQ ID No. 17). The resulting fragment was purified using a Gene-Clean kit (Dianova GmbH, Hilden) and cloned in accordance with the manufacturer's information into the vector PCR-Script from Stratagene GmbH, Heidelberg. The correctness of the sequence was checked by sequencing. It was transferred as HindIII fragment from this PCR-Script vector into the correspondingly cut vector pBin19 (Bevan, 1984, Nucleic Acids Res. 12, 8711-8721).

Amend the paragraph on page 38, lines 30-46, as follows:

The 35S promoter, the transketolase transit peptide, the DOXS gene and the polyadenylation signal of gene 3 of the T DNA of the Ti plasmid pTIACH5 (Gielen et al., 1984) for termination of transcription was isolated by PCR from the plasmid pBinAR-TP-DOXS. An EcoRI cleavage site was attached to each of the oligonucleotides for the promoter and terminator sequence. The sequence of the oligonucleotide which anneals onto the promoter (in italics) is 5'- atgaattcca tggagtcaaa gattcaaata ga [ATGAATTCCATGGAGTCAAAGATTCAAATAGA] -3' (SEQ ID No. 18), and that of the oligonucleotide which anneals onto the terminator sequence (in italics) is 5'- atgaattcgg acaatcagta aattgaa-cgg ag [ATGAATTCGGACAATCAGTAAATTGAA-CGGAG] -3' (SEQ ID No. 19). The fragment was purified using a Gene-Clean kit (Dianova GmbH, Hilden) and cloned in accordance with the manufacturer's information into the vector PCR-Script (Stratagene GmbH, Heidelberg). The correctness of the sequence was checked by sequencing (SEQ ID No. 3). It was transferred as EcoRI fragment from the PCR-Script vector into the correspondingly cut vector pBin19 (Bevan, 1984).

Amend the paragraph on page 42, lines 17-26, as follows:

Oligonucleotides were derived for a PCR from the geranylgeranyl-pyrophosphate oxidoreductase DNA sequence (Keller et al., Eur. J. Biochem. (1998)251(1-2), 413-417); Accession Number Y14044), and

a BamHI restriction cleavage site was attached at the 5' end of these and a SalI restriction cleavage site was attached at the 3' end. The oligonucleotide at the 5' end comprises the sequence 5'- atggatccat ggcgacgacg gttacactc [ATGGATCCATGGCGACGACGGTTACACTC] - 3' (SEQ ID No. 20) starting with the first codon of the cDNA (in italics), and the oligonucleotide at the 3' end comprises the sequence 5'- atgtcgacgt gatgatagat tactaacaga c [ATGTCGACGTGATGATAGATTACTAACAGAC] -3' (SEQ ID No. 21) starting with base pair 1494 of the cDNA sequence (in italics).

Amend the paragraph on page 43, line 34, to page 44, line 3, as follows:

The 35S promoter, the transketolase transit peptide, the DOXS gene and the polyadenylation signal of gene 3 of the T DNA of the Ti plasmid pTIACH5 (Gielen et al., 1984) for termination of transcription was isolated from the plasmid pBinAR-TP-DOXS by PCR. An EcoRI cleavage site was attached in each case to the oligonucleotides for the promoter and the terminator sequence. The sequence of the oligonucleotide which anneals onto the promoter (in italics) is 5'- atgaattcca tggagtcaaa gattcaaata ga [ATGAATTCCATGGAGTCAAAGATTCAAATAGA] -3' (SEQ ID No. 22), and that of the oligonucleotide which anneals onto the terminator sequence (in italics) is 5'- atgaattcgg acaatcagta aattgaacgg ag [ATGAATTCGGACAATCAGTAAATTGAACGGAG] -3' (SEQ ID No. 23). The fragment was purified using a Gene-Clean kit (Dianova GmbH,



Hilden) and cloned in accordance with the manufacturer's information into the vector PCR-Script from Stratagene GmbH, Heidelberg. The correctness of the sequence was checked by sequencing. It was transferred from the PCR-Script vector as EcoRI fragment into the correspondingly cut vector pBin19 (Bevan, Nucleic Acids Res. 12 (1984), 8711-8721).

Amend the paragraph on page 44, lines 5-32, as follows:

The 35S promoter, the GGPPOR gene and the polyadenylation signal of gene 3 of the T DNA of the Ti plasmid pTIACH5 (Gielen et al., 1984) for termination of transcription was isolated from the plasmid pBinARHyg-GGPPOR by PCR. An XbaI cleavage site was attached in each case to the oligonucleotides for the promoter and the terminator. The sequence of the oligonucleotide which anneals onto the promoter (in italics) is 5'- attctagaca tggagtcaaa -gattcaaata ga [ATTCTAGACATGGAGTCAAA-GATTCAAATAGA] -3' (SEQ ID No. 24), and that of the oligonucleotide which anneals onto the terminator sequence (in italics) is 5'- attctagagg acaa-tcagta aattgaacgg ag [ATTCTAGAGGACAA-TCAGTAAATTGAACGGAG] -3' (SEQ ID No. 25). The fragment was purified using a Gene-Clean kit (Dianova GmbH, Hilden) and cloned in accordance with the manufacturer's information onto the vector PCR-Script from Stratagene GmbH, Heidelberg. The correctness of the sequence was checked by sequencing. It was transferred from the PCR-Script

vector as XbaI fragment into the correspondingly cut vector which already contained, as described above, the DOXS sequence. The result was the construct pBinAR-DOXS-GGPPOR (Figure 15), whose fragments have the following significance:

Fragment A (529 bp) comprises the 35S promoter of cauliflower mosaic virus (nucleotides 6909 to 7437 of cauliflower mosaic virus). Fragment B comprises the transit peptide of the plastidic transketolase. Fragment E comprises the DOXS gene. Fragment D comprises the polyadenylation signal of gene 3 of the T DNA of the Ti plasmid pTIACH5 (Gielen et al., 1984) for termination of transcription. Fragment F comprises the GGPPOR gene including the intrinsic plastid transit sequence.

Amend the paragraph on page 45, lines 1-17, as follows:

To clone HPPD into vectors which additionally contain another cDNA, oligonucleotides were derived for a PCR, and a BamHI restriction cleavage site was attached to them at the 5' end and 3' end. The oligonucleotide at the 5' end comprises the sequence 5'- ggatcctcca gcggaacaac [GGATCCTCCAGCGGACAAGCCAAC] -3' (SEQ ID No. 26) (nucleotides 37 to 55 distant from ATG in the 5' direction; in italics), and the oligonucleotide at the 3' end comprises the sequence 5'- atggatcccg cgccgcctac aggttg [ATGGATCCCGCGCCGCCTACAGGTTG] -3' (SEQ ID No. 27) (ending with base pair 1140 of the coding sequence, starting 8 base pairs 3'

of the TAG stop codon; in italics). The PCR reaction was carried out with Tli polymerase from Promega GmbH, Mannheim in accordance with the manufacturer's information. 10 ng of the plasmid pBinAR-HPPD were employed as template. The PCR program was as follows:

5 cycles: 94°C 4 sec, 68°C 30 sec, 72°C 2 min;

5 cycles: 94°C 4 sec, 64°C 30 sec, 72°C 2 min;

25 cycles: 94°C 4 sec, 60°C 30 sec, 72°C 2 min.

Amend the paragraph on page 45, lines 29-46, as follows:

For the cloning, the 35S promoter, the transketolase transit peptide, the p-HPPD gene and the polyadenylation signal of gene 3 of the T DNA of the Ti plasmid pTIACH5 (Gielen et al. 1984) for termination of transcription was isolated from the plasmid pBinAR-TP-p-HPPD by PCR. A HindIII cleavage site was attached in each case to the oligonucleotides for the promoter and the terminator. The sequence of the oligonucleotide which anneals onto the 5' region of the promoter (in italics) is 5'- ataagcttca tggagtcaaa -gattcaaata ga [ATAAGCTTCATGGAGTCAAA-GATTCAAATAGA] -3' (SEQ ID No. 28), and that of the oligonucleotide which anneals onto the termination sequence (in italics) is 5'- ataagcttgg ac-aatcagta aattgaacgg ag [ATAAGCTTGGAC-AATCAGTAAATTGAACGGAG] -3' (SEQ ID No. 29). The resulting fragment was purified using a Gene-Clean kit (Dianova GmbH, Hilden) and cloned in accordance with the manufacturer's information into the vector PCR-Script

from Stratagene GmbH, Heidelberg. The correctness of the sequence was checked by sequencing. It was transferred as HindIII fragment from this PCR-Script vector into the correspondingly cut vector pBin19 (Bevan, 1984, Nucleic Acids Res. 12, 8711-8721).

Amend the paragraph on page 46, lines 1-17, as follows:

The 35S promoter, the transketolase transit peptide, the DOXS gene and the polyadenylation signal of gene 3 of the T DNA of the Ti plasmid pTIACH5 (Gielen et al., 1984) for termination of transcription was isolated from the plasmid pBinAR-TP-DOXS by PCR. An EcoRI cleavage site was attached in each case to the oligonucleotides for the promoter and the terminator sequence. The sequence of the oligonucleotide which anneals onto the promoter (in italics) is 5'- atgaattcca tggagtcaaa gattcaaata ga [ATGAATTCCATGGAGTCAAAGATTCAAATAGA] -3' (SEQ ID No. 30), and that of the oligonucleotide which anneals onto the terminator sequence (in italics) is 5'- atgaattcgg acaatcagta aattgaacgg ag [ATGAATTCGGACAATCAGTAAATTGAACGGAG] -3' (SEQ ID No. 31). The fragment was purified using a Gene-Clean kit (Dianova GmbH, Hilden) and cloned in accordance with the manufacturer's information into the vector PCR-Script from Stratagene GmbH, Heidelberg. The correctness of the sequence was checked by sequencing. It was transferred from the PCR-Script vector as EcoRI fragment into the correspondingly cut vector which already

contained the HPPD sequence as described above.

Amend the paragraph on page 46, line 19, to page 47, line 2, as follows:

The 35S promoter, the GGPPOR gene and the polyadenylation signal of gene 3 of the T DNA of the Ti plasmid pTIACH5 (Gielen et al., 1984) for termination of transcription was isolated from the plasmid pBinARHyg-GGPPOR by PCR. An XbaI cleavage site was attached in each case to the oligonucleotides for the promoter and the terminator. The sequence of the oligonucleotide which anneals onto the promoter (in italics) is 5'- attctagaca tggagtcaaa -gattcaaata ga [ATTCTAGACATGGAGTCAAA-GATTCAAATAGA] -3' (SEQ ID No. 32), and that of the oligonucleotide which anneals onto the terminator sequence (in italics) is 5'- attctagagg acaa-tcagta aattgaacgg ag [ATTCTAGAGGACAA-TCAGTAAATTGAACGGAG] -3' (SEQ ID No. 33). The fragment was purified using a Gene-Clean kit (Dianova GmbH, Hilden) and cloned in accordance with the manufacturer's information into the vector PCR-Script from Stratagene GmbH, Heidelberg. The correctness of the sequence was checked by sequencing. It was transferred from the PCR-Script vector as XbaI fragment into the correspondingly cut vector which already contained the HPPD and DOXS sequences as described above. The result was the construct pBinAR-DOXS-GGPPOR-HPPD (Figure 16), whose fragments have the following significance:

Fragment A (529 bp) comprises the 35S promoter of cauliflower

mosaic virus (nucleotides 6909 to 7437 of cauliflower mosaic virus). Fragment B comprises the transit peptide of the plastidic transketolase. Fragment E comprises the DOXS gene. Fragment D comprises the polyadenylation signal of gene 3 of the T DNA of the Ti plasmid pTIACH5 (Gielen et al., 1984) for termination of transcription. Fragment F comprises the GGPPOR gene including the intrinsic plastid transit sequence.

**COPY OF ALL CLAIMS**

1. The use of DNA sequences coding for a 1-deoxy-D-xylulose-5-phosphate synthase (DOXS) for producing plants with increased tocopherol, vitamin K, chlorophyll and/or carotenoid contents.
2. The use of a DNA sequence SEQ ID No. 1 or SEQ ID No. 3 or of a DNA sequence which hybridizes with the latter and codes for a 1-deoxy-D-xylulose-5-phosphate synthase (DOXS) for producing plants with increased content of tocopherols, vitamin K, chlorophylls and/or carotenoids.
3. The use of DNA sequences coding for a 1-deoxy-D-xylulose-5-phosphate synthase (DOXS) and coding for a p-hydroxyphenylpyruvate dioxygenase (HPPD) for producing plants with increased tocopherol, vitamin K, chlorophyll and/or carotenoid contents.
4. The use of a DNA sequence SEQ ID No. 1 or SEQ ID No. 3 and of a DNA sequence SEQ ID No. 5 or of a DNA sequence which hybridizes with the latter and codes for a 1-deoxy-D-xylulose-5-phosphate synthase (DOXS) and a p-hydroxyphenylpyruvate dioxygenase for producing plants with increased content of tocopherols, vitamin K, chlorophylls and/or carotenoids.
5. The use of DNA sequences coding for a 1-deoxy-D-xylulose-5-phosphate synthase (DOXS) and coding for a geranylgeranyl-pyrophosphate oxidoreductase (GGPPOR) for producing plants with increased tocopherol, vitamin K, chlorophyll

and/or carotenoid contents.

6. The use of a DNA sequence SEQ ID No. 1 or SEQ ID No. 3 and of a DNA sequence SEQ ID No. 7 or of a DNA sequence which hybridizes with the latter and codes for a 1-deoxy-D-xylulose-5-phosphate synthase (DOXS) and a geranylgeranyl-pyrophosphate oxidoreductase (GGPPOR) for producing plants with increased tocopherol, vitamin K, chlorophyll and/or carotenoid contents.

7. The use of DNA sequences coding for a 1-deoxy-D-xylulose-5-phosphate synthase (DOXS) and coding for a hydroxyphenylpyruvate dioxygenase (HPPD) and coding for a geranylgeranyl-pyrophosphate oxidoreductase (GGPPOR) for producing plants with increased tocopherol, vitamin K, chlorophyll and/or carotenoid contents.

8. The use of a DNA sequence SEQ ID No. 1 or SEQ ID No. 3 and of a DNA sequence SEQ ID No. 5 and of a DNA sequence SEQ ID No. 7 or of a DNA sequence which hybridizes with the latter and codes for a 1-deoxy-D-xylulose-5-phosphate synthase (DOXS), a hydroxyphenylpyruvate dioxygenase (HPPD) and a geranylgeranyl-pyrophosphate oxidoreductase (GGPPOR) for producing plants with increased content of tocopherols, vitamin K, chlorophylls and/or carotenoids.

9. A process for producing plants with increased tocopherol, vitamin K, chlorophyll and/or carotenoid contents, which comprises expressing a DNA sequence SEQ ID No. 1 or SEQ ID No. 3 or a DNA sequence which hybridizes with the latter in plants.



10. A process for producing plants with increased tocopherol, vitamin K, chlorophyll and/or carotenoid contents, which comprises expressing a DNA sequence SEQ ID No. 1 or SEQ ID No. 3 and a DNA sequence SEQ ID No. 5 or DNA sequences which hybridize with the latter in plants.

11. A process for producing plants with increased tocopherol, vitamin K, chlorophyll and/or carotenoid contents, which comprises expressing a DNA sequence SEQ ID No. 1 or SEQ ID No. 3 and a DNA sequence SEQ ID No. 7 or DNA sequences which hybridize with the latter in plants.

12. A process for producing plants with increased tocopherol, vitamin K, chlorophyll and/or carotenoid contents, which comprises expressing DNA sequences SEQ ID No. 1 or SEQ ID No. 3, SEQ ID No. 5 and SEQ ID No. 7 or DNA sequences which hybridize with the latter in plants.

13. A process for transforming a plant, which comprises introducing an expression cassette comprising a promoter and a DNA sequence SEQ ID No. 1 or SEQ ID No. 3 into a plant cell, into callus tissue, a whole plant or protoplasts of plant cells.

14. A process for transforming a plant, which comprises introducing an expression cassette comprising a promoter and DNA sequences SEQ ID No. 1 or SEQ ID No. 3 and SEQ ID No. 5 into a plant cell, into callus tissue, a whole plant or protoplasts of plant cells.

15. A process for transforming a plant, which comprises introducing an

expression cassette comprising a promoter and DNA sequences SEQ ID No. 1 or SEQ ID No. 3 and SEQ ID No. 7 into a plant cell, into callus tissue, a whole plant or protoplasts of plant cells.

16. A process for transforming a plant, which comprises introducing an expression cassette comprising a promoter and DNA sequences SEQ ID No. 1 or SEQ ID No. 3, SEQ ID No. 5 and SEQ ID No. 7 into a plant cell, into callus tissue, a whole plant or protoplasts of plant cells.

17. A process for transforming plants as claimed in claim 13-16, wherein the transformation takes place with the aid of the strain *Agrobacterium tumefaciens*, of electroporation or of the particle bombardment method.

18. A plant transformed with an expression cassette as set forth in claim 13-16.

19. A plant as claimed in claim 18 selected from the group of soybean, canola, barley, oats, wheat, oilseed rape, corn or sunflower.

20. The use of SEQ ID No. 1 or SEQ ID No. 3 for producing a test system for identifying DOXS inhibitors.

21. A test system based on the expression of an expression cassette as set forth in claim 13 for identifying DOXS inhibitors.

22. The use of a plant comprising a DNA sequence SEQ ID No. 1 or SEQ ID No. 3 or a DNA sequence which hybridize with the latter for producing plant and

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bacterial DOXS.

**CLAIMS FOR FURTHER PROSECUTION IN THE U.S.**

1. The use of DNA sequences coding for a 1-deoxy-D-xylulose-5-phosphate synthase (DOXS) for producing plants with increased tocopherol, vitamin K, chlorophyll and/or carotenoid contents.
2. The use of a DNA sequence SEQ ID No. 1 or SEQ ID No. 3 or of a DNA sequence which hybridizes with the latter and codes for a 1-deoxy-D-xylulose-5-phosphate synthase (DOXS) for producing plants with increased content of tocopherols, vitamin K, chlorophylls and/or carotenoids.
3. The use of DNA sequences coding for a 1-deoxy-D-xylulose-5-phosphate synthase (DOXS) and coding for a p-hydroxyphenylpyruvate dioxygenase (HPPD) for producing plants with increased tocopherol, vitamin K, chlorophyll and/or carotenoid contents.
4. The use of a DNA sequence SEQ ID No. 1 or SEQ ID No. 3 and of a DNA sequence SEQ ID No. 5 or of a DNA sequence which hybridizes with the latter and codes for a 1-deoxy-D-xylulose-5-phosphate synthase (DOXS) and a p-hydroxyphenylpyruvate dioxygenase for producing plants with increased content of tocopherols, vitamin K, chlorophylls and/or carotenoids.
5. The use of DNA sequences coding for a 1-deoxy-D-xylulose-5-phosphate synthase (DOXS) and coding for a geranylgeranyl-pyrophosphate oxidoreductase (GGPPOR) for producing plants with increased tocopherol, vitamin K, chlorophyll and/or carotenoid contents.
6. The use of a DNA sequence SEQ ID No. 1 or SEQ ID No. 3 and of a DNA

- sequence SEQ ID No. 7 or of a DNA sequence which hybridizes with the latter and codes for a 1-deoxy-D-xylulose-5-phosphate synthase (DOXS) and a geranylgeranyl-pyrophosphate oxidoreductase (GGPPOR) for producing plants with increased tocopherol, vitamin K, chlorophyll and/or carotenoid contents.
7. The use of DNA sequences coding for a 1-deoxy-D-xylulose-5-phosphate synthase (DOXS) and coding for a hydroxyphenylpyruvate dioxygenase (HPPD) and coding for a geranylgeranyl-pyrophosphate oxidoreductase (GGPPOR) for producing plants with increased tocopherol, vitamin K, chlorophyll and/or carotenoid contents.
  8. The use of a DNA sequence SEQ ID No. 1 or SEQ ID No. 3 and of a DNA sequence SEQ ID No. 5 and of a DNA sequence SEQ ID No. 7 or of a DNA sequence which hybridizes with the latter and codes for a 1-deoxy-D-xylulose-5-phosphate synthase (DOXS), a hydroxyphenylpyruvate dioxygenase (HPPD) and a geranylgeranyl-pyrophosphate oxidoreductase (GGPPOR) for producing plants with increased content of tocopherols, vitamin K, chlorophylls and/or carotenoids.
  9. A process for producing plants with increased tocopherol, vitamin K, chlorophyll and/or carotenoid contents, which comprises expressing a DNA sequence SEQ ID No. 1 or SEQ ID No. 3 or a DNA sequence which hybridizes with the latter in plants.
  10. A process for producing plants with increased tocopherol, vitamin K, chlorophyll and/or carotenoid contents, which comprises expressing a DNA sequence SEQ

- ID No. 1 or SEQ ID No. 3 and a DNA sequence SEQ ID No. 5 or DNA sequences which hybridize with the latter in plants.
11. A process for producing plants with increased tocopherol, vitamin K, chlorophyll and/or carotenoid contents, which comprises expressing a DNA sequence SEQ ID No. 1 or SEQ ID No. 3 and a DNA sequence SEQ ID No. 7 or DNA sequences which hybridize with the latter in plants.
  12. A process for producing plants with increased tocopherol, vitamin K, chlorophyll and/or carotenoid contents, which comprises expressing DNA sequences SEQ ID No. 1 or SEQ ID No. 3, SEQ ID No. 5 and SEQ ID No. 7 or DNA sequences which hybridize with the latter in plants.
  13. A process for transforming a plant, which comprises introducing an expression cassette comprising a promoter and a DNA sequence SEQ ID No. 1 or SEQ ID No. 3 into a plant cell, into callus tissue, a whole plant or protoplasts of plant cells.
  14. A process for transforming a plant, which comprises introducing an expression cassette comprising a promoter and DNA sequences SEQ ID No. 1 or SEQ ID No. 3 and SEQ ID No. 5 into a plant cell, into callus tissue, a whole plant or protoplasts of plant cells.
  15. A process for transforming a plant, which comprises introducing an expression cassette comprising a promoter and DNA sequences SEQ ID No. 1 or SEQ ID No. 3 and SEQ ID No. 7 into a plant cell, into callus tissue, a whole plant or protoplasts of plant cells.

16. A process for transforming a plant, which comprises introducing an expression cassette comprising a promoter and DNA sequences SEQ ID No. 1 or SEQ ID No. 3, SEQ ID No. 5 and SEQ ID No. 7 into a plant cell, into callus tissue, a whole plant or protoplasts of plant cells.
17. A process for transforming plants as claimed in claim 13, wherein the transformation takes place with the aid of the strain *Agrobacterium tumefaciens*, of electroporation or of the particle bombardment method.
18. A plant transformed with an expression cassette as set forth in claim 13.
19. A plant as claimed in claim 18 selected from the group of soybean, canola, barley, oats, wheat, oilseed rape, corn or sunflower.
20. The use of SEQ ID No. 1 or SEQ ID No. 3 for producing a test system for identifying DOXS inhibitors
21. A test system based on the expression of an expression cassette as set forth in claim 13 for identifying DOXS inhibitors.
22. The use of a plant comprising a DNA sequence SEQ ID No. 1 or SEQ ID No. 3 or a DNA sequence which hybridize with the latter for producing plant and bacterial DOXS.